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OFFICIALDocket No.
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LR:DLSIN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Seiji Hirano et al.

Group Art Unit: 2853

Application No.: 09/976,668

Examiner: M. Brooke

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For: PRINTER INCLUDING
AN INK CARTRIDGE

Reissue of: U.S. Patent No. 6,027,204

Issued: February 22, 2000

DECLARATION UNDER 37 C.F.R. 1.132Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1

Sir,

I, Kazuo Saito, declare and state that:

1. I am a citizen of Japan, residing at No. 507-25, Hirooka Yoshida, Shiojiri-shi, Nagano, Japan.
2. I am a graduate of the Tokyo University of Science, Tokyo, Japan, where I was awarded the Degree of Bachelor of Mechanical Engineering, in March, 1987.
3. I am presently employed by Seiko Epson Corporation, Hirooka Office, 80 Harashinden, Hirooka, Shiojiri-shi, Nagano-ken, Japan and I have been so employed by Seiko Epson since April, 1987.
4. From April, 1987 until November, 1992, I was engaged in mechanical designing of thermal printers. From December, 1992, until October, 2003, I performed the mechanical designing of ink jet printers. Since November, 2003, I have been engaged in manufacturing technology for commercial products of ink jet printers. These fields are related to the field of this application.

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5. From 1984 until 2002 I belonged to the Japanese Society of Mechanical Engineers, which is concerned with the broad field of mechanical engineering, including printing technology, and I have considered magazines published by the Society. Owing to my heavy workload, I have not maintained my membership in the Society.
6. In October, 1998, I delivered a presentation entitled "High Precision Mechanism of Epson Ink Jet Printers" to a committee for the study of molded-plastic gears at the 41st Conference of the Japan Society for Precision Engineers held in Tokyo, Japan.
7. Because of my education, work, and my involvement in various professional associations I am very knowledgeable regarding the current literature, theory and recent developments relating to ink jet printer technology.
8. I am a named inventor of the following eight U.S. Patents: No. 6,655,864 (entitled "DOT RECORDING APPARATUS"), No. 6,113,289 (entitled "DOT RECORDING DEVICE"), No. 5,946,016 (entitled "PRINTER SHEET DISCHARGE METHOD"), No. 5,874,970 (entitled "SERIAL PRINTER AND PRINTING METHOD"), No. 5,850,235 (entitled "PRINTER"), No. 5,805,176 (entitled "INK JET PRINTER AND DEVICE FOR INSURING PROPER PRINTING"), No. 5,803,633 (entitled "PRINTER FOR FEEDING PRINTING SHEETS OF DIFFERENT THICKNESSES"), and No. 5,648,807 (entitled "INK JET RECORDING APPARATUS HAVING AN ANTISMEAR SHEET DEFORMATION DISCHARGE SYSTEM"). These patents are all concerned with aspects of printer technology, including ink jet printer technology.
9. Based upon my own applications for U.S. patents, I am familiar with various aspects of U.S. patent practice.
10. I am submitting this Declaration on behalf of the assignee of the instant application in order to establish facts regarding the teachings of the prior art.

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11. I can read and write Japanese and English. I sometimes use a dictionary when reading or writing English documents.

12. I have carefully read and understand the prosecution history of the present application, including the Office Action mailed on August 27, 2003 ("the Office Action").

13. I have carefully read and understand the references applied in the Office Action, namely, Japanese Patent Application Publication No. 4-7185 to Ishii et al., and U.S. Patent No. 5,136,308 to Saito et al.¹. I also have considered U.S. Patent Nos. 5,515,094 to Tanaka et al. and No. 5,393,151 to Martin et al., which are mentioned in the Office Action.

14. At the time this invention was made, a person skilled in the art would have had at least a bachelor's degree in an engineering discipline such as mechanical engineering or electrical engineering. That person skilled in the art also would have had work experience in the field of this invention, such as at least three years of work designing ink jet printers.

15. I do not believe that the rejection of claims 24-38 under 35 U.S.C. § 103 over Ishii in view of Saito is proper because those references cannot be applied together. At the time the present invention was made, a person skilled in the art would not have combined Ishii and Saito in a way that would suggest the present invention because the teachings of Ishii and Saito lead away from such a combination. I base this conclusion upon the following facts.

16. Ishii teaches a serial ink jet printer which mounts a movable print head on a carriage. As can be seen in Figs. 1 and 2, the carriage rides on guides 8 and 9, which

¹ I am not the Saito named as an inventor on U.S. Patent No. 5,136,308.

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are connected by movable levers 14. During recording, the print head reciprocates back and forth across the width of the printer.

17. Ishii's print head is positioned above a flat portion of platen 5. As shown in Fig. 2, this flat portion extends continuously across substantially the entire width of the printer (in the scanning direction). The print head is separated from the underlying platen 5 by a gap, and the recording medium passes through that gap between the print head and the flat platen 5.

18. Ishii's movable levers 14 and guides 8 and 9 form a linkage that allows the gap between the print head and the flat platen 5 to vary. This linkage allows the print head to sway or shift upward and downward relative to the recording medium and so change the size of the gap between the print head and the platen 5. Ishii's head moves upward away from the platen 5 if the recording medium is thick, and toward the platen 5 if the recording medium is thin. In other words, Ishii's head floats up and down.

19. A front edge 17 of the paper pressing plate 15 presses against the recording medium. As the paper pressing plate 15 moves integrally with a movable lever, a gap between the print head and the printing medium is kept constant even if the thickness

20. U.S. Patent No. 5,136,308 to Saito discloses in Figs. 31A-32B ribbed platens. Figs. 31A and 32A are views of the topsides of the platens, looking downward. A person skilled in the art would recognize that Saito's ribs 12a extend in length along the direction which the recording medium is conveyed, and a number of those ribs are arranged at intervals across the width of the recording area. In the views shown in Fig. 27, the recording medium would be printed on an opposite side to the surface thereof facing the top of the printing apparatus.

21. I also note that in Fig. 27, which is a side cross-sectional view of Saito's printer, the recording medium lies in a vertical plane where it passes the ribs.

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22. I believe a person skilled in the art would understand Ishii to teach that the front edge 17 of the paper pressing plate 15 is continuously flat. Platen 5 itself might not be continuously flat over the entire widthwise direction of the printer, in manner of the front edge 17, meaning that in theory the platen 5 of Ishii could be replaced with a platen with ribs like that taught in the Saito reference and the printer would still work.

23. I do not, however, find any basis for the asserted combination of Ishii and Saito. The Office Action asserts in the last paragraph beginning on page 3 that these reference would be combined to use the Saito ribbed platen in Ishii's printer in order to prevent ink scattering and contamination of the recording medium. I conclude that this ground is not persuasive because it is contrary to the plain teachings of the reference.

24. In Ishii, the paper moving upward comes into engagement with the front edge 17 of the paper pressing plate 15 so that the feeding path of the paper is controlled. In this operation the paper moves generally upward away from the platen 5 while the direction is controlled by the plate edge 17, and therefore the paper does not contact the underlying platen 5. In other word, the printing medium emerges between rollers 1 and 4 at an upward angle and strikes the plate edge 17 of the plate 15 and does not rest on the lower platen 5.

25. This means the recording medium extending upward would not touch Ishii's platen 5, and could not be contaminated by any ink that is on the platen during the normal printing operation. So the asserted problem said to justify the combination of Ishii and Saito, avoiding contamination of the recording medium with ink on platen beneath, is not present. Consequently, I conclude there is no reason for one of skill in the art to combine Ishii and Saito.

26. I also conclude that one skilled in the art would not combine Ishii and Saito in an attempt to prevent the cockling phenomenon, for the reasons which follow.

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27. First, a person skilled in the art considering the issue of cockling would not refer to Ishii because Ishii is merely concerned with adjusting the gap between the print head and the paper when the thickness of the paper varies. This area of concern involves purely the mechanical design of the structure that holds the head, and it is not related to the ink used or the manner in which droplets are ejected.

28. Cockling, however, is a phenomenon caused by the ink used or the droplets ejected. Particularly in 1992, at the time the invention in this application was made, the cockling phenomenon was not well known to persons of ordinary skill in the art.

29. Ishii therefore does not even recognize the problem that is solved by the present invention, much less suggest a solution to the problem such as the invention in this application. Accordingly, I consider that Ishii teaches away from the subject matter of the present invention.

30. Nor does Saito suggest the problem solved by this invention.

31. Further, there is no motivation to combine Ishii with the other prior art when the cockling problem arises.

32. Even if the platen with ribs such as is taught by Saito were substituted for the platen 5 of Ishii's printer, the resulting printer mechanism would not serve to prevent the cockling problem. As already explained, in Ishii, as shown in Fig. 1, the paper feed roller 1 rotates clockwise and the paper, which is fed by the feed roller 1 and the paper pressing roller 4, moves upward (in the tangent direction of the roller 1).

33. The paper moving upward comes into engagement with the front edge 17 of the paper pressing plate 15 so that the feeding path of the paper is controlled. In this operation the paper moves generally upward while the direction is controlled by the plate edge 17, and therefore the paper does not contact the underlying platen 5. So the

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paper emerges between rollers 1 and 4 at an upward angle and strikes the plate edge 17 of the plate.

34. This means even if the platen 5 of Ishii's printer had ribs or projections as taught by Saito, no force for urging the paper downward toward the ribs on the platen 5 is applied to the paper and the ribs would not act to control the cockling of the paper.

35. In the same manner, ribs 12a, as can be seen in Fig. 31A of Saito, would not suppress the cockling problem. This is because, as shown in Figs. 13 and 27, the curving paper 11 fed to the printing section is urged toward the printhead, not the platen 12. Therefore, as apparently the paper would not be urged against the ribs 12a of the platen 12, the ribs 12a do not serve the function of suppressing cockling.

36. So for this reason too one skilled in the art would not combine Ishii and Saito.

37. In contrast, in the present invention, as claimed, and as seen in Figs. 27 and 31, paper fed by the feed roller 330 contacts the tip end (or presser) 141 of the plate 140 so that the paper directs toward the paper guides or projections 112 formed on the platen and comes into abutment against the same.

38. In conclusion, the suggestion in the Office Action to combine Ishii and Saito by modifying Ishii's printer to use the ribbed platen taught by Saito is in error. This means the references would not be combined by one skilled in the art.

39. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that

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such willful false statements may jeopardize the validity of the application or any patent
issuing thereon.

Date: February 24, 2004

斉藤 一夫
Kazuo Saito